UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/875,716	06/06/2001	Devendra Vidhani	03226.110001;P6194	7131

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KANG, INSUN

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<table>
<tr>
<td rowspan="2">Office Action Summary</td>
<td>Applicati n No.
09/875,716</td>
<td>Applicant(s)
VIDHANI ET AL.</td>
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<td>Examiner
Insun Kang</td>
<td>Art Unit
2124</td>
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-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>03 November 2004</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-41</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-41</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the amendment filed 11/3/2004.

2.   As per applicant's request, claims 1-15, 26-31, and 37-39 have been amended.

Claims 1-41 are pending in the application.

Specification

3.   The objection to the specification has been withdrawn due to the amendment to

the specification.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine,
> manufacture, or composition of matter, or any new and useful improvement
> thereof, may obtain a patent therefor, subject to the conditions and requirements
> of this title.

5.   Claims 1-15, 26-31 and 37-39 are rejected under 35 U.S.C. 101 because the

claimed invention is directed to non-statutory subject matter.

Claims 1-15, 26-31 and 37-39 are non-statutory because they are directed to a

computer system comprising instructions. Although the independent claim start out

reciting a "computer system," the system does not have structural elements and it

comprises only one element, "instructions" that are disembodied arrangements so as to

be called a "computer program" or compilation of facts, information, or data *per se*,

without creating any functional interrelationship, either as part of the stored data or as

part of the computing processes performed by the computer ("acts") or computer

readable medium so as to enable the computer to perform the claimed instructions for

"finding a worst case aggressor set of a victim net" as recited. With no other structure in

the independent claims to rely on, the alleged "computer system" of the independent

claims turn out to be non-statutory for being a computer program per se. Thus the

claims represent non-functional descriptive material that is not capable of producing a

useful result, and hence represent only abstract ideas. Therefore, the claims are non-

statutory.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7.   Claims 1-13, 16-18, 21-29, 32-34 and 37-41 are rejected under 35 U.S.C. 102(e)

as being anticipated by Carlson et al. (US Patent 6,128,769) hereinafter referred to as

"Carlson."

Per claim 26:

Carlson discloses:

- solving a problem to find a worst case aggressor net based on a logically exclusive set

(i.e. "reducing the noise problems induced by cross-talk by determining the worst case

peak cross-talk noise experienced by a signal due to cross-coupling capacitances to

other signals," col 1 lines 5-14; "perform ...logic filtering, cross-talk attacker filtering," col

3 lines 4-8)

-using a first representation to represent the logically exclusive set, selecting the first

representation (i.e. "performing cross-talk-attacker filtering on a plurality of signal lines

to identify a first set of potential attacker signals on a first set of potential attacker signal

lines that cause signal noise upon said victim signal," col 2 lines 3-12)

-selecting a second representation, wherein the second representation represents an

adjacent net of the first representation (i.e. "a second set of potential attacker signals on

a second set of potential attacker signal lines that cause signal noise upon the victim

signal line," col 2 lines 3-12)

-removing an association of the first representation, removing the first representation

(i.e. "filtering on a plurality of signals signal lines to identify a first set of potential

attacker signals on a first set of potential attacker signal lines," col 2 lines 3-12)

-removing an association of the second representation, removing the second

representation (i.e. "filtering on a plurality of signals signal lines to identify a second set

of potential attacker signals on a second set of potential attacker signal lines," col 2

lines 3-12)

-retuning the adjacent net represented by the second representation as the

worst case aggressor net (i.e. "the worst set of active attackers (the ones with the worst

noise) are determined," col 9 lines 12-25)

as claimed.

Per claim 27:

The rejection of claim 26 is incorporated, and further, Carlson discloses that the first

representation is a first node, and wherein the second representation is a second node

(i.e. "a first attacker signal cross-talks with the victim signal and causes a signal nosie

spike upon the victim node," col 4 lines 18-25) as claimed.

Per claim 28:

The rejection of claim 26 is incorporated, and further, Carlson discloses that the

association of the first representation is an edge, and wherein the association of the

second representation is an edge (i.e. col 5 lines 56-65) as claimed.

Per claim 29:

The rejection of claim 26 is incorporated, and further, Carlson discloses that the

adjacent net represented by the second representation has a weight greater than

another net in the problem (i.e. col 9 lines 40-67) as claimed.

Per claim 34, they are the software tool versions of claim 29, respectively, and are

rejected for the same reasons set forth in connection with the rejection of claim 29

above.

Per claim 38:

See the rejection of claim 27 above.

Per claim 39:

See the rejection of claim 28 above.

Per claims 40 and 41, they are the software tool versions of claim 32 and 37,

respectively, and are rejected for the same reasons set forth in connection with the

rejection of claim 32 and 37 above.

Per claim 1:

Carlson discloses:

-finding a worst case aggressor set of a victim net based on a plurality of logically

exclusive sets (i.e. "reducing the noise problems induced by cross-talk by determining

the worst case peak cross-talk noise experienced by a signal due to cross-coupling

capacitances to other signals," col 1 lines 5-14; "perform ... logic filtering, cross-talk

attacker filtering," col 3 lines 4-8)

-forming a first set, wherein the first set comprises an aggressor net of the

victim net(i.e. "performing cross-talk-attacker filtering on a plurality of signal lines to

identify a first set of potential attacker signals on a first set of potential attacker signal

lines that cause signal noise upon said victim signal," col 2 lines 3-12)

-using the first set and the plurality of logically exclusive sets to formulate a problem;

solving the problem to determine a worst case aggressor net of the victim net, wherein

the worst case aggressor set comprises the worst case aggressor net(i.e. "reducing the

noise problems induced by cross-talk by determining the worst case peak cross-talk

noise experienced by a signal due to cross-coupling capacitances to other signals," col

1 lines 5-14; "perform ... logic filtering, cross-talk attacker filtering," col 3 lines 4-8)

as claimed.

Per claim 2:

The rejection of claim 1 is incorporated, and further, Carlson discloses:

the plurality of logically exclusive sets comprises a mutually exclusive set, and wherein

the mutually exclusive set comprises a signal net (i.e. col 3 lines 9-27) as claimed.

Per claim 3:

The rejection of claim 1 is incorporated, and further, Carlson discloses:

the aggressor net in the first set has a corresponding weight(i.e. col 9 lines 40-67) as

claimed.

Per claim 4:

The rejection of claim 1 is incorporated, and further, Carlson discloses:

finding the worst case aggressor net of the victim net (i.e. col 1 lines 5-14) as claimed.

Per claim 5:

The rejection of claim 1 is incorporated, and further, Carlson discloses:

-forming a second set, wherein the second set comprises an aggressor net

that is in the first set and that is part of the plurality of logically exclusive sets(i.e. "a

second set of potential attacker signals on a second set of potential attacker signal lines

that cause signal noise upon the victim signal line," col 2 lines 3-12) as claimed.

Per claim 6:

The rejection of claim 5 is incorporated, and further, Carlson discloses:

-forming a third set, wherein the third set comprises an aggressor net that is in the first set but is not part of the second set (i.e. col 9 lines 12-25) as claimed.

Per claim 7:

The rejection of claim 6 is incorporated, and further, Carlson discloses:

the aggressor net in the third set becomes part of the worst case aggressor set (i.e. "the hightest Delta C Value is chosen as the worst case Delta C Value," cl 6 lines 55-64; col 9 lines 12-25) as claimed.

Per claim 8:

The rejection of claim 5 is incorporated, and further, Carlson discloses:

-reducing each of the plurality of logically exclusive sets to a second plurality of logically exclusive sets such that a net in a set of the second plurality of logically exclusive sets is part of the second set (i.e. "reducing the noise problems induced by cross-talk by determining the worst case peak cross-talk noise experienced by a signal due to cross-coupling capacitances to other signals," col 1 lines 5-14; "perform ... logic filtering, cross-talk attacker filtering," col 3 lines 4-8) as claimed.

Per claim 9:

The rejection of claim 8 is incorporated, and further, Carlson discloses that an empty

set in the second plurality of logically exclusive sets is removed from the second

plurality of logically exclusive sets (i.e. "filtering on a plurality of signal lines to identify a

first set of potential attacker signals on a first set of potential attacker signal lines that

cause signal noise upon said victim signal, performing safety window filtering on a

plurality of signals signal lines to identify a second set of potential attacker signals on a

second set of potential attacker signal lines that cause signal noise upon the victim

signal," abstract) as claimed.

Per claim 10:

The rejection of claim 1 is incorporated, and further, see the rejection of claim 37 above.

Per claim 11:

The rejection of claim 10 is incorporated, and further, see the rejection of claim 38

above.

Per claim 12:

The rejection of claim 10 is incorporated, and further, see the rejection of claim 39

above.

Per claim 13:

The rejection of claim 10 is incorporated, and further, see the rejection of claim 29

above.

Per claims 16-25, they are the software tool versions of claim 2, 3,7,8, 10 and 13,

respectively, and are rejected for the same reasons set forth in connection with the

rejection of claim 2, 3,7,8, 10 and 13 above.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   . Claims 14, 15, 19, 20, 30, 31, 35 and 36 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Carlson et al. (US Patent 6,128,769) hereinafter referred to as

"Carlson" as applied to claim 1-13, 16-18, 21-29, 32-34 and 37-41 above.

Per claim 31:

The rejection of claim 26 is incorporated, and further, Carlson does not explicitly teach a

bipartite graph. However, Official Notice is taken that a bipartite graph was known in

the art of software development and graphical modeling, at the time applicant's

invention was made, to decompose two disjoint sets such that no two graph vertices

within the same set are adjacent. It would have been obvious for one skilled in the art

of computer software development and graphical modeling to modify Carlson's

disclosed system to use a bipartite graph. The modification would be obvious because

one skilled in the art would be motivated to easily represent the "cross-talk attacker

filtering" between various sets.

Per claim 30:

The rejection of claim 26 is incorporated, and further, see the rejection of claim 31

above.

Per claim 14:

The rejection of claim 1 is incorporated, and further, see the rejection of claim 31 above.

Per claim 19, 20, 35, and 36:

The are the software tool versions of claim 31, respectively, and are rejected for the

same reasons set forth in connection with the rejection of claim 32 above.

Per claim 15:

The rejection of claim 12 is incorporated, and further, see the rejection of claim 31

above.

Response to Arguments

10.   Applicant's arguments filed 11/3/2004 have been fully considered but they are

not persuasive.

Per claims 1, 16, 26, 32, 37, and 40:

The Applicant states that:

The present invention is directed to ...During noise analysis of a quiet victim net...the worst case

aggressor nets represent the worst potential case of noise injection on the victim net...Carlson, in

contrast to the present invention fails at least to disclose the limitations of the claimed invention discussed

above. In fact, Carlson is altogether silent as performing noise analysis on a victim net based on a logically exclusive set of aggressor nets (page 16).

In response to applicant's argument that the reference fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., During noise analysis of a quite victim net, if the victim net is capacitively coupled to one or more aggressor nets that are part of a logically exclusive aggressor set, then only one of those aggressor nets can switch at a given time .... where the worst case aggressor nets represent the worst potential case of noise injection on the victim net (page 15-16)) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As such, the claims are read with the broadest reasonable interpretation in mind (Note MPEP 2111).

Carlson states, i.e. "the set of active attackers that generate the type of signal noise that creates the biggest impact on the victim signal line (col.11 lines 20-26)" and a " determination is then made regarding whether the noise of the worst case set of active attackers exceeds the noise tolerance of the most sensitive receiver on the victim signal line...then the next victim signal line is analyzed by performing cross-talk attacker filtering," col. 11 lines 27-40). As the applicant admits that a processor has multiple logically exclusive sets of nets in page 16 and Carlson performs attacker signals logic filtering on signal lines that cause signal noise upon a victim signal, Carlson teaches performing noise analysis on a victim net based on a logically exclusive set of aggressor nets.

The applicant further argues that:

Carlson disclose that logic filtering is performed to eliminate potential attacker signals that have no logic

relationship with the victim signals or group attacker signals together that have a logic relationship...

Thus, in Carlson, logic filtering removes aggressor nets that have no logical relationship to a victim net.

This is entirely distinct from a logically exclusive set, in which all the aggressor nets in the logically

exclusive set to have a relationship with a victim net...although only one of the aggressor nets can switch

at any given time (page 17).

In response, as noted above, the independent claims do not recite the limitation, "a

logically exclusive set, in which all the aggressor nets in the logically exclusive set to

have a relationship with a victim net... although only one of the aggressor nets can

switch at any given time." Further, Carlson states, i.e. "The attacker signals that are

found to not switch at the same time as the victim signal, based upon logic relationships

between victim signals and attacker signal and relationship among attacker signals of a

particular victim signal, can be eliminated (col. 5 lines 26-34). Accordingly, it is clear

that the victim nets have a relationship with the attacker signals in Carlson. Therefore,

in view of the broadest reasonable interpretation above, Carlson discloses the

limitations in the claims. Therefore, the rejection of claims 1, 16, 26, 32, 37, and 40 is

considered proper and maintained.

In response to the applicant statement that the dependent claims are allowable

for the same reasons as the independent claims: as has been shown above, the

rejection of independent claims by Carlson is considered proper, the argument that the

dependent claims are allowable as being dependent on allowable base claims is

considered moot. Accordingly, the rejections of claims 2-15,17-25, 27-31, 33-36, 38-39 and 41 are proper and maintained.

Conclusion

11.   THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

IK
1/21/2005

JOHN CHAVIS
PATENT EXAMINER
ART UNIT 2124